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AEGIS and Ship Self-Defense System (SSDS) Platforms: Using KVA Analysis, Risk Simulation and Strategic Real Options to Assess Operational Effectiveness

Acquisition Research Program:
Creating Synergy for Informed Change

Managing Acquisitions in an Open Architecture, Open Business Model Environment

Dr. Thomas J. Housel

Managing Acquisitions in an OA/Open Business Model Environment:

Tracking Management Performance

Problem

- Open business acquisition models are more complex to manage requiring greater innovation from acquisition managers.
- Managers are supposed to make “change” happen: How well do individual managers do this?
- Establishing a relationship between management performance and organizational outcome (e.g. revenue, capability, productivity, output)
- Need a common objective metric to measure management performance

Previous Approaches for Structuring Problem

- There are no comprehensive objective approaches to valuing individual managers
- Majority of previous research focuses on qualitatively ***improving*** management's performance
- Most prior research agrees that management adds value to the organization but does not quantify the amount of value each manager adds

Management Value Added Approach (MVA)

- What is MVA?
  - An approach to objectively valuing individual managers contributions to organizational outcomes
  - It is an extension of the knowledge value added (KVA) theory designed to account for non-algorithmically definable processes – such as management
  - The focus is on managers' outputs, not currently accounted for by standard KVA theory
    - These "dark matter" outputs are management messages that focus on: innovation, predictions, future thinking/non-algorithmically definable processes/creativity/etc.
  - MVA assumes that managers are supposed to use their "dark matter" outputs to positively influence organizational outcomes (e.g., revenue, capabilities)

Management Value Added Approach (MVA)

- Operationalization: Strict KVA extension and Correlational approach
- Preliminary tests of the concept: Does it make sense?
  - Strict KVA approach—CMA—Ship Track Management
  - Research Question—Can we objectively measure management dark matter outputs? (e.g. Job description approach)
  - Hypothesis Test of correlational approach
    - ARCI Open Business Model Example (in progress)

Results: Strict KVA Approach

- Ship tracking process: Role of Track Manager
  - **6% of total track management output was dark matter output**
- Proof of concept operationalization: expanding traditional KVA approach was relatively painless
- Appeared that this management assignment could be automated over time
- Due to relatively minimal management contribution, risk and uncertainty could be "managed" by the team—cost reduction

Correlational Approach: ARCI example

- First order hypothesis: There will be a greater amount of management dark matter outputs in the ARCI message sample then in the proprietary message sample.
  - Preliminary results: dark matter management messages 4 times as long as routine management messages
- Algorithm development (see paper)
  - Delta in “dark matter” management outputs can be categorized and tracked over time
  - Delta in this management output can be shown to correspond to changes in organizational outcomes (e.g., revenue, capabilities)
- Comparing management outputs in ARCI example with management outputs in proprietary system acquisition example.
- Data collection and analysis is continuing

Implications

- Open Business Acquisition Models place more demands on managers: Dark Matter Outputs must increase
- Performance Monitoring, Feedback, Transparency, Accountability, and Reward Structures must reinforce managers to use their Dark Matter capabilities to:
  - Recognize options
  - Improve organizational outcomes
  - Mitigate risks and recognize uncertainties
  - Avoid catastrophic failures
- MVA performance results will:
  - Identify those managers who lead change in a positive direction
  - Help weed out those managers who cannot adapt
  - Provide an objective basis for increasing fairness

Limitations and Future Research

- Correlational Approach: Need data on cycle time conversion ratio for introduction of innovation-change to implementation-production among organizations
  - Conversion ratio: dark matter output/organizational outcome
  - Need to collect data on dark matter outputs over time

- Developing a practical non-semantic approach to quantifying dark matter output
  - Calibration is an issue—attempt to get common units of dark matter outputs
  - Need to move from correlations among deltas to coefficient that converts deltas to absolute values

Backup slide

- Using the strict KVA approach, managers contribute to total output, including their dark matter outputs, can be quantified objectively
- Strict KVA approach for measuring MVA can be easily incorporated into existing software and data modeling
- Helps to quantify management performance when dealing with complex issues
- Management may be consumed with routine activity that inhibits them from utilizing their dark matter